

L. J. KOZUB.
ADJUSTABLE BEARING.
APPLICATION FILED JAN. 28, 1916.

1,186,211.

Patented June 6, 1916.

FIG. 1.

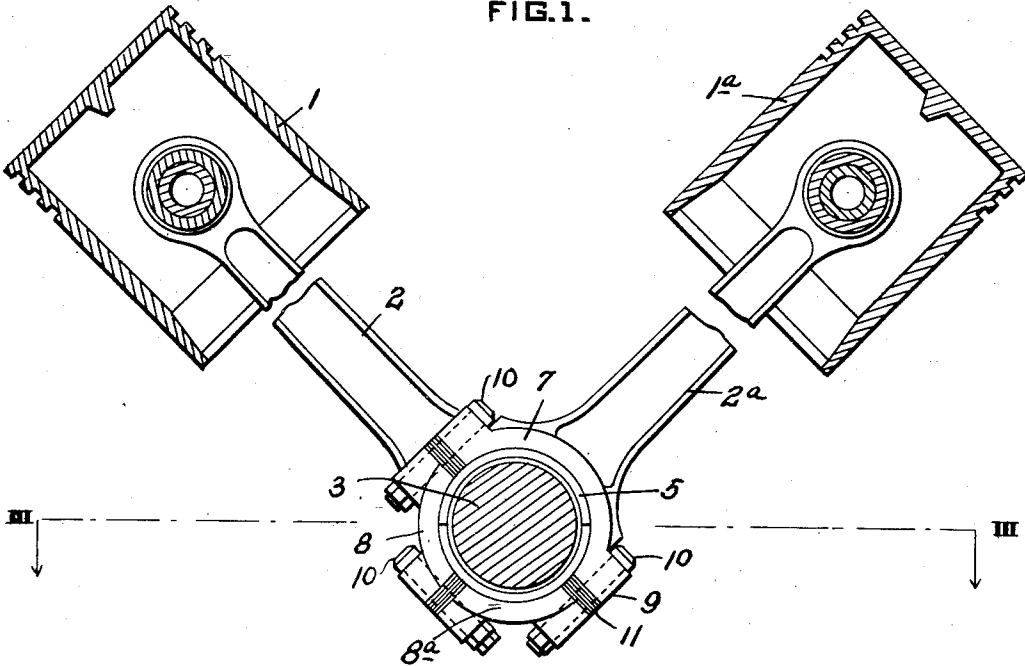


FIG. 2.

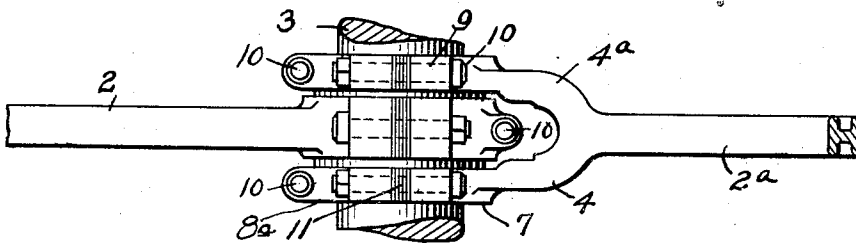
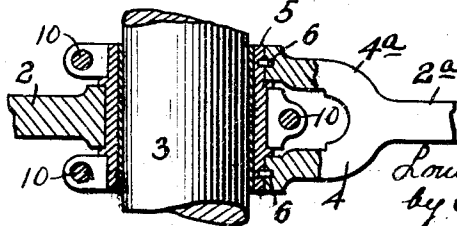


FIG. 3.



WITNESSES

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UNITED STATES PATENT OFFICE.

LOUIS J. KOZUB, OF PITTSBURGH, PENNSYLVANIA.

ADJUSTABLE BEARING.

1,186,211.

Specification of Letters Patent.

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Application filed January 28, 1916. Serial No. 74,806.

To all whom it may concern:

Be it known that I, LOUIS J. KOZUB, residing at Pittsburgh, in the county of Allegheny and State of Pennsylvania, a citizen of the United States, have invented or discovered certain new and useful Improvements in Adjustable Bearings, of which improvements the following is a specification.

The object of my invention is to provide an adjustable bearing housing for shafts, spindles, etc., whereby the bearing, after having been worn in service, may be brought to substantial conformity with its contained cylindrical shaft or like member.

While my invention may be embodied in various types of friction bearings, and in bearings for various purposes, it finds particular adaptability to crank rods of internal combustion engines, and especially to V-type engines wherein blade and fork crank-rods are arranged in pairs, the members of which lie in a common plane, and which, at the point of their attachment to the crank shaft, have a common bushing between them and such shaft.

In the accompanying sheet of drawings I have illustrated the preferred embodiment of my invention as applied to engines of the type just mentioned.

Figure 1 is a sectional view through a crank shaft and two piston heads, showing the adjustable bearing housings in elevation; Fig. 2 a plan view of the central portion of Fig. 1, the piston rods being indicated as if lying in the horizontal line III—III; and Fig. 3 a sectional view taken on the line III—III, Fig. 1, the piston rods lying in such line in the same manner as shown in Fig. 2.

In the practice of my invention I provide for the shaft or like member a wear-compensating bushing which may be a continuous cylinder provided with a weakened compressible strip or portion such as shown in my United States Patent No. 1,156,695. Surrounding such bushing I provide a housing consisting of at least three parts adjustably connected to each other in such a manner that, when adjustment is made to compensate for wear, the bushing will be brought to substantial conformity with the shaft. While, as far as the broad features of my invention are concerned, there may, surrounding each bushing, be but one adjustable housing of the character described, it is particularly advantageous in construc-

tions wherein several housings engage or surround a single bushing.

In the illustrative embodiment of my invention two pistons 1 and 1^a are, through crank or piston rods 2 and 2^a, connected to a crank shaft 3. The rod 2 is a blade rod, and the rod 2^a a fork rod divided at its end into two parts 4 and 4^a which engage the shaft 3 at opposite sides of the housing at the end of the blade rod 2. As will be seen, the rods 2 and 2^a lie in a common plane, but their lines of reciprocation are substantially at right angles to each other. Surrounding the shaft 3, and within the housings at the ends of the rods, there is a split ring wear-compensating bushing 5, which, as shown in Fig. 3, is preferably attached to the forked rod 2^a by means of pins 6. Since each of the housings at the ends of the rods 2 and 2^a are the same, it will be necessary to describe but one of them, and to thereafter explain their coöperation in effecting the desired bearing-adjustment. Referring particularly to the bearing housing at the end of the fork rod as seen in Fig. 1, it will be observed that it comprises a semi-cylindrical portion 7 and two quarter-cylindrical portions 8 and 8^a. The semi-cylindrical housing portion is formed by and between two laterally projecting arms at the end of the rod part 4, and, for a purpose presently to be explained, these arms are so proportioned and made of such material that they may, under pressure, yield slightly. The ends of the housing portions are provided with lugs 9 having suitable holes through them to receive clamping bolts 10, and at the points of connection of the housing portions suitable liners or spacers 11 are placed between the adjacent parts. Each of these liners may be single solid blocks of metal, but each preferably consists of a plurality of thin strips of metal.

Before describing the manner of adjusting the housing, it should be explained that the thrust of the rods upon the shaft, and, on the intake stroke, the pull of the shaft upon the rods, causes substantially an even wear upon the entire bushing, and such a wear as could not properly be taken up by adjusting the housing and bushing in one direction. When it becomes desirable to adjust the housing the several bolts 10 are removed, the housings disassembled, and the adjacent edges of the bushing 5 filed down until, when applied to the shaft 3, the two

bushing parts fall just short of meeting at such adjacent edges. In again assembling the housings, one or more of the liners 11 are omitted (a trial-and-error method being used to determine just how many liners should be retained), and the bolts 10 inserted. The bolts connecting the semi-cylindrical with the quarter-cylindrical housing parts are first tightened, and then the bolts connecting the quarter-cylindrical parts. In tightening the latter bolts the afore-mentioned yieldable portions of each semi-cylindrical housing part spring inwardly, thus compressing the bushing so that both its inner and outer friction bearing surfaces conform substantially to reduced cylinders.

According to the provisions of the patent statutes, I have described the principle and operation of my invention together with the construction which I now consider to represent the best embodiment thereof. However, I desire to have it understood that the construction shown is only illustrative, and that my invention may be practised by other forms of construction.

I claim as my invention:

1. An adjustable bearing comprising in combination a cylindrical flexible bushing, a three-part housing surrounding said bushing, and adjustable means for clamping said housing parts together.

2. An adjustable bearing comprising in combination a cylindrical flexible bushing, a three-part housing surrounding said bushing and consisting of a semi-cylindrical part and two substantially quarter-cylindrical parts, and adjustable bolts for clamping said housing parts together, each of said bolts engaging the edges of adjacent housing parts.

3. The combination of a crank rod pro-

vided at one end with laterally projecting arms forming a semi-cylindrical portion of an adjustable three-part housing, quarter-cylindrical housing portions adjustably secured to said first-named portion and to each other, and a flexible bushing within said housing.

4. The combination of a crank rod provided at one end with yieldable laterally-projecting arms forming a semi-cylindrical portion of an adjustable three-part housing, quarter cylindrical housing portions secured to said first-named portion and to each other, and means for adjusting said housing portions at their points of connection to each other whereby said laterally-projecting arms may be sprung inwardly.

5. The combination with a crank shaft, of a cylindrical flexible bushing surrounding it, blade and forked crank rods provided with adjustable bearing housings engaging said bushing, and means for adjusting each of said housings at three points.

6. The combination of a crank shaft, a cylindrical flexible bushing surrounding it, reciprocatory blade and crank rods lying in a common plane but disposed at an angle to each other, the ends of each of said rods being provided with laterally extending arms forming semi-cylindrical portions of adjustable three-part housings, two quarter-cylindrical housing parts secured to each of said first named housing parts and to each other, and means for adjusting said housings at the points of connection of said several parts thereof.

In testimony whereof I have hereunto set my hand.

LOUIS J. KOZUB.

Witnesses:

PAUL N. CRITCHLOW,
FRANCIS J. TOMASSON.